

E2 Sub F1
17. **(Amended three times)** The isolated *Leptospira* bacterium according to claim 16, wherein the rRNA gene sequence comprises a nucleotide sequence which is at least 85% identical to SEQ ID NO.: 7 or a complementary nucleotide sequence thereto.

E3 Sub F1
19. **(Amended three times)** The isolated *Leptospira* bacterium according to claim 1, wherein the bacterium has the characteristics of the microorganism deposited under AGAL Accession No. N95/69684.

E4 Sub F1
75. **(Amended)** The isolated *Leptospira* bacterium according to claim 5, wherein said livestock and companion animals are selected from the group consisting of: pigs, bovines, sheep, goats, horses, deer, alpaca, dogs and cats.

Sub F1
124. **(Twice amended)** The isolated *Leptospira* bacterium according to claim 1, wherein said bacterium is a non-infectious or attenuated bacterium.

ES
125. **(Twice amended)** The isolated *Leptospira* bacterium according to claim 124, wherein said attenuated bacterium consists of a killed isolated bacterium.

REMARKS

Claim 1 has been amended and support for the amendment can be found in the specification as filed, for example, on page 3, line 18 to page 5, line 1, page 6, lines 6-12 and within Examples 4 and 5 on pages 42 to 48 and Examples 8-11 on pages 51 to 58. Claims 17, 19, 75, 124 and 125 have been amended to correct minor informalities. Thus, no new matter has been added herewith.

Additionally, the Applicants would like to thank the Examiner for withdrawal of the previous novelty and obviousness rejections.

The following remarks address the substance of the Office Action:

I. Matters of written description

The Examiner has rejected claims 1-2, 75 and 124-126 under 35 U.S.C. § 112, first paragraph on the assertion that the specification does not provide evidence of an isolated *Leptospira* bacterium that is serologically cross-reactive to the deposited *Leptospira* strain and that the specification does not teach the identities of bacterial strains serologically cross reactive to the deposited strain.

The present invention involves an "isolated pathogenic *Leptospira* bacterium, wherein said bacterium: a) belongs to serovar hurstbridge, wherein said bacterium is cross-reactive in a

cross-agglutination absorption assay with the *Leptospira fainei* strain WKID deposited under AGAL Accession No. N95/69684; b) belongs to sero group Hurstbridge and cross-agglutinates with share group antigens of the *Leptospira fainei* strain WKID deposited under AGAL Accession No. N95/69684, wherein said bacterium does not cross-agglutinate with the members of other *Leptospira* groups; or c) belongs to the species *Leptospira fainei* and wherein said bacterium comprises genomic DNA which is at least 40% homologous to the genomic DNA derived from *Leptospira fainei* strain WKID deposited under AGAL Accession No. N95/69684," as recited in amended claim 1.

The specification provides description for an isolated pathogenic *Leptospira* bacterium as claimed in amended claim 1 at, for example, page 3, line 18 to page 5, line 1, page 6, lines 6-12 and within Examples 4 and 5 on pages 42 to 48 and Examples 8-11 on pages 51 to 58. The specification discloses not only the deposit number of an exemplified isolated bacterium, but also a sequence as described in SEQ ID NO: 1. In addition, further characteristics include specifying its antigenic relationship in a cross agglutination absorption assay, both serovar and serogroup, and its growth characteristics. Therefore, genomic, antigenic and growth characteristic information has been provided for the claimed isolated pathogenic *Leptospira* bacterium. Thus, Applicants submit that the written description requirement has been met for claims 1-2, 75 and 124-126.

In addition, the Examiner has rejected claims 15-18 under 35 U.S.C. § 112, first paragraph on the assertion that the specification does not disclose nucleotide sequences with 80% identity to SEQ ID NO: 1-2 or 4-7 or complementary sequences comprised within the *Leptospira* bacterium.

As stated above, amended claim 1 (of which claims 15 to 18 are dependent upon) is directed to an isolated pathogenic *Leptospira* bacterium with either specific serological properties such as belonging to serovar hurstbridge and cross-reacting with the *Leptospira fainei* strain WKID deposited under AGAL Accession No. N95/69684 or belonging to sero group Hurstbridge and cross-agglutinating with share group antigens of the *Leptospira fainei* strain WKID deposited under AGAL Accession No. N95/69684, or with specific genomic properties such as belonging to the *L. fainei* species and having homology with a deposited *L. fainei* strain. The 16S rRNA sequence of the *Leptospira fainei* strain WKID deposited under AGAL Accession No. N95/69684 is described in SEQ ID NO: 1. Figure 2, as described on page 40, lines 11-18; depicts an alignment of SEQ ID NO: 1 with other species of the *Leptospira* genus as described in the Sequence Listing as SEQ ID NOs: 8-14. Page 8, lines 17-25 of the specification state that SEQ ID NOs: 2-7 "...relate to primer sequences specific for the rRNA gene of serovar

hurstbridge or sero group Hurstbridge or *L. fainei*..." and that SEQ ID NO: 2 is "...useful a primer pair for the diagnostic detection of the pathogenic *Leptospira* bacterium of the species or serogroup Hurstbridge using the polymerase chain reaction." A representative sequence has been described in SEQ ID NO: 1 which inherently comprises either the nucleotide sequence as set forth in SEQ ID NOs: 2 and 4-7 or their complement. Therefore, Applicants have described nucleotide sequences with 80% identity to SEQ ID NO: 1-2 or 4-7 or complementary sequences comprised within the *Leptospira* bacterium and respectfully submit that the written description requirement has been met for claims 15-18.

II. The claimed invention does not include new matter

The Examiner has rejected claims 1-20, 75 and 124-126 under 35 U.S.C. § 112, first paragraph on the assertion that there is no support in the specification for the recitation of a bacterium that is serologically cross-reactive to the *Leptospira* strain WKID (AGAL Accession No. N95/69683), thereby raising issues of new matter.

The bacterium of amended claim 1 includes a bacterium which "...belongs to serovar hurstbridge, wherein said bacterium is cross-reactive in a cross-agglutination absorption assay with the *Leptospira fainei* strain WKID deposited under AGAL Accession No. N95/69684" or "...belongs to sero group Hurstbridge and cross-agglutinates with share group antigens of the *Leptospira fainei* strain WKID deposited under AGAL Accession No. N95/69684, wherein said bacterium does not cross-agglutinate with the members of other *Leptospira* groups." As discussed above, the specification as filed supports amended claim 1 and does not raise issues of new matter. Therefore, the rejection to the claims is inapplicable and Applicants respectfully request withdrawal of the rejection to claims 1-20, 75 and 124-126.

III. Matters of enablement

The Examiner has rejected claims 1-20, 75 and 124-126 under 35 U.S.C. § 112, first paragraph on the assertion that the specification fails to enable an isolated pathogenic *Leptospira* bacterium that is serologically cross reactive to the *Leptospira* strain WKID (AGAL Accession No. N95/69684). The rejection extends this non-enablement assertion to the claims directed to at least 80% homology to SEQ ID NOs: 1, 2 and 4-7.

The present claims are drawn to an "isolated pathogenic *Leptospira* bacterium, wherein said bacterium: a) belongs to serovar hurstbridge, wherein said bacterium is cross-reactive in a cross-agglutination absorption assay with the *Leptospira fainei* strain WKID deposited under AGAL Accession No. N95/69684; b) belongs to sero group Hurstbridge and cross-agglutinates with share group antigens of the *Leptospira fainei* strain WKID deposited under AGAL Accession No. N95/69684, wherein said bacterium does not cross-agglutinate with the members of other *Leptospira* groups; or c) belongs to the species *Leptospira fainei* and wherein

said bacterium comprises genomic DNA which is at least 40% homologous to the genomic DNA derived from *Leptospira fainei* strain WKID deposited under AGAL Accession No. N95/69684."

As discussed above, the specification teaches and enables: a bacterium that belongs to serovar hurstbridge and is cross-reactive in a cross-agglutination absorption assay with the *Leptospira fainei* strain WKID deposited under AGAL Accession No. N95/69684 (see page 4, lines 1-4 and Example 4); a bacterium which belongs to sero group Hurstbridge and cross-agglutinates with share group antigens of the *Leptospira fainei* strain WKID deposited under AGAL Accession No. N95/69684, wherein said bacterium does not cross-agglutinate with the members of other *Leptospira* groups (see page 4, lines 12-17 and Example 5); and/or a bacterium which belongs to the species *Leptospira fainei* and wherein said bacterium comprises genomic DNA which is at least 40% homologous to the genomic DNA derived from *Leptospira fainei* strain WKID deposited under AGAL Accession No. N95/69684 (see page 4, lines 20-26, page 6, lines 6-12, Examples 8 and 11).

In addition, Applicants are submitting herewith a paper (attached as Exhibit A) of Arzouni et al. from *Emerging Infectious Diseases* (August 2002, 8:8, p. 865-868) which includes an isolation of a pathogenic *L. fainei* bacterium whose 16S rDNA sequence had 100% identity with GenBank Accession No. 60954 (attached herewith as Exhibit B), which is equivalent to *Leptospira fainei* strain WKID deposited under AGAL Accession No. N95/69684 (see p. 865, col. 2, lines 46-49). This bacterium, however, only reacted with *L. fainei* in a Western Blot (see p. 866, col. 1, last few lines and p. 867, para. bridging columns 1 and 2) even though it was tested serologically with servovar hurstbridge. This bacterium falls within c) of amended claim 1 as well as claims of at least 80% homology to SEQ ID NO: 1. The results from this attached paper could not have been obtained without the disclosure from the presently claimed invention (see References).

In view of the admitted novelty of the presently-claimed invention, the Applicants have enabled an isolated pathogenic *Leptospira fainei* bacterium with at least 40% sequence homology to the deposited strain WKID as presently-claimed as evidenced by the attached paper (and others listed within this paper's References). In addition, the breadth of the presently claimed invention is defined within 1) pathogenic *Leptospira* bacterium, more specifically, pathogenic *Leptospira fainei* species comprising genomic DNA which is at least 40% homologous to the genomic DNA derived from *Leptospira fainei* strain WKID deposited under AGAL Accession No. N95/69684. The Applicants have given numerous characteristics of such a bacterium, from the 16S rRNA (rDNA) sequence, to growth conditions, to possible antigenic classifications of the bacterium as well as recognized that such a pathogenic bacterium may not be limited to serovar hurstbridge and/or serogroup Hurstbridge.

Therefore, in view of the above remarks, Applicants submit the presently claimed invention is enabled by the disclosure and respectfully request the withdrawal of the rejection to the claims under 35 U.S.C. § 112, first paragraph.

IV. Matters of definiteness

Claims 1-20, 75 and 124-126 have been rejected under 35 U.S.C. § 112, second paragraph on the assertion that the term "serologically cross reactive" is a relative term which renders the claims indefinite. The term "serologically cross reactive" is not present in amended claim 1, thereby rendering the rejection to the claims inapplicable. Accordingly, Applicants respectfully request withdrawal of the rejection to the claims under 35 U.S.C. § 112, second paragraph.

V. Conclusion

Claims 1, 17, 19, 75, 124 and 125 have been amended and the amendments are supported within the filed specification as discussed above. The changes made to the claims by the current amendment, including insertions and **[deletions]**, are shown on an attached sheet entitled **VERSION WITH MARKINGS TO SHOW CHANGES MADE**, which follows the signature page of this amendment.

If any issues remain that may be addressed by a phone conversation, the Examiner is invited to contact the undersigned at the phone number listed below. Please charge any additional fees, including any fees for additional extension of time, or credit overpayment to Deposit Account No. 11-1410.

Respectfully submitted,

KNOBBE, MARTENS, OLSON & BEAR, LLP

Dated: 16 January 2003

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VERSION WITH MARKINGS TO SHOW CHANGES MADE

1. **(Twice amended)** An isolated pathogenic *Leptospira* bacterium, [that is serologically cross reactive to] wherein said bacterium:

a) belongs to serovar hurstbridge, wherein said bacterium is cross-reactive in a cross-agglutination absorption assay with the *Leptospira fainei* strain WKID deposited under [(J)AGAL Accession No. N95/69684(]);

b) belongs to sero group Hurstbridge and cross-agglutinates with share group antigens of the *Leptospira fainei* strain WKID deposited under AGAL Accession No. N95/69684, wherein said bacterium does not cross-agglutinate with the members of other *Leptospira* groups; or

c) belongs to the species *Leptospira fainei* and wherein said bacterium comprises genomic DNA which is at least 40% homologous to the genomic DNA [derived] from *Leptospira fainei* strain WKID deposited under AGAL Accession No. N95/69684.

17. **(Amended three times)** The isolated *Leptospira* bacterium according to claim 16, wherein the rRNA gene sequence comprises a nucleotide sequence which is at least [85%] identical to SEQ ID NO.: 7 or a complementary nucleotide sequence thereto.

19. **(Amended three times)** The isolated *Leptospira* bacterium according to claim 1, [having] wherein the bacterium has [the characteristics] of the microorganism deposited under AGAL Accession No. N95/69684. *Relative*

75. **(Amended)** The isolated *Leptospira* bacterium according to [C]claim 5, wherein said livestock and companion animals are selected from the group consisting of: pigs, bovines, sheep, goats, horses, deer, alpaca, dogs and cats.

124. **(Twice amended)** The isolated *Leptospira* bacterium according to claim 1, wherein said bacterium is a non-infectious or attenuated bacterium.

125. **(Twice amended)** The isolated *Leptospira* bacterium according to claim 124, wherein said attenuated bacterium consists of a killed isolated bacterium.